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ABSTRACT

On the premise that it is important to examine parental attitudes as children enter the middle grades since it is at this point that decision shaping students' subsequent course taking patterns are made, this study examined the degree to which parents were involved in the assignment of their children to mathematics courses in the seventh grade. Two adjacent suburban school districts having similar demographics but different policies on track placement were chosen for the study. Data indicating parental social class, educational level, and involvement in their children's education were collected by using scales and interviews. There was a high correlation between the parents' educational level and student placement in mathematics ability groups in the sixth and seventh grade. Students in the lowest level were significantly more likely than students in the other two levels to be living in a single parent family. Parental knowledge about the tracking system, parental integration into school affairs and informal parental networks, parental intervention in children's education, and parental influence over children's math course choices. (YP)

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Social Class and Ability Group Placement in Mathematics in the Transition to Seventh Grade: The Role of Parental Involvement

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This study examines the degree to which parents are involved in the assignment of their children to mathematics courses in the seventh grade. This is a key decision point in U.S. children's school careers in mathematics because it determines whether they are admitted to the "fast track" which leads to algebra in the eighth grade and calculus (or another fifth year math course) in the twelfth grade, or placed in "regular" college preparatory math, a repititious, arithmetic-driven curriculum in the middle grades, or a remedial track. Rubinson (1986) has noted that, compared with other countries, there is no one point in U.S. students' academic careers which determines their eventual scholastic attainment. Instead, there are a number of times in students' progression through the education system when choices about curricular placement and programs have to be made. Successful negotiation of the system, therefore, requires "active parental management" of children's schooling (Baker and Stevenson, 1986). The transition to seventh grade mathematics is one of those critical points that requires parents in the U.S. public schools to be knowledgeable and involved.

The research examining family and school connections has focused on parental involvement in children's cognitive development, school-based volunteer work and activities, parent-teacher communication, and school governance (Litwack and Meyer, 1974; Heyns, 1978; Lightfoot, 1978; Marjoribanks, 1979; Moles, 1982, 1987; Becker and Epstein, 1982; Clark, 1983; Scott-Jones, 1984; Epstein, 1985, 1986, 1987, 1988; Dornbusch et al., 1987; Lareau, 1987, 1989; Swap, 1987; Epstein and Dauber, 1988; Miller and Casserly, 1988; Dauber and Epstein, 1989), but there has been very little examination of parental influence over children's assignment to courses and ability groups.

Yet we know from recent studies that track placement and coursetaking, especially at the middle and secondary grades, play a major role in determining children's academic achievement. Gamoran (1987) has demonstrated that the divergent coursetaking patterns of students in different tracks at the high school level explain much of the association between track placement and achievement, especially in mathematics. Further, he shows that social class differences in achievement are largely explained by students' track placement and related coursetaking sequences. Not surprisingly, those who take advanced math and science courses have significantly higher mathematics achievement scores than those who do not, even when parents' socioeconomic status is taken into account. Other studies have shown that average ability students from high social class homes are more likely to be pushed up in the tracking system, partly because of their parents' explicit efforts to insure the assignment of their children to more advanced ability levels and coursework (Baker and Stevenson, 1986; Lareau, 1987, 1989; Vanfossen, Jones and Spade, 1987). On the other hand, high performing students from the lowest socioeconomic quartile have only about a 50 percent chance of being placed in the academic track in high school (Vanfossen, Jones, and Spade, 1987).

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Well educated U.S. parents are much more likely than less educated parents to intervene in a lengthy series of small but crucial ways to improve their children's educational opportunities. Indeed the work of Lareau (1987, 1989) and Baker and Stevenson (1986) and Stevenson and Baker (1987) shows that the impact of social class on achievement is largely mediated by such parental involvement. Highly educated parents have a greater propensity to employ a variety of strategies to insure that their children are placed in more demanding classes. Data from High School and Beyond demonstrate that students are more likely to gain in mathematics achievement in high school if their parents are actively involved in course selection (Ekstrom, Goertz, and Rock, 1988). Where curriculum choice abounds, as it does in U.S. public schools, parental knowledge of and involvement in course placement becomes more consequential, a phenomenon which has the effect of widening class differences (Schafer and Olexa, 1971; Cusick, 1983; Powell, Farrar, and Cohen, 1983; Lee and Ekstrom, 1987). Catholic and other private schools have succeeded in reducing the connection between social class and achievement in part because they more frequently assign students to academically demanding courses reqardless of family background and prior achievement (Coleman, Hoffer, and Kilgore, 1982; Hoffer, Greeley and Coleman, 1985; Lee and Bryk, 1988, 1989).

Lareau (1987, 1989) has drawn on and expanded Bordieu's concept of "cultural capital" (Bordieu, 1977a, 1977b, Bourdieu and Passeron, 1977) in explaining how more affluent and educated parents are able to pass on their social class status to their children in the early grades. This "capital," argues Lareau (1989), includes their "educational competence, their social confidence, the information they [have] about their children's schooling, their conception of parents' proper role in education, and their children's classroom performance." (p. 145) The array of financial resources, practical knowledge about schooling, and interpersonal skills possessed by these parents enables them to be far more proficient in "customizing" their children's education in order to maximize mobility and achievement in the educational system. In particular, well-educated parents are much more likely to be knowledgeable about the schooling process and their own child's performance, to be active in school affairs and integrated into informal networks of information, and to feel comfortable about intervening at the school site to maximize their children's learning. Lareau found that not all upper-middle class parents "activate" their "cultural capital" but they are far more likely than working class parents to know what is going on in their children's classes and to intervene in the school setting when necessary.

This investigation takes Lareau's perspective and applies it to an older group, children in the middle grades, and to a particular educational decision point, the placement in an ability track in mathematics. It is important to examine parental attitudes and behavior as children enter the middle grades because it is at this point that important curriculum decisions are made that shape students' subsequent coursetaking patterns. This is especially true in mathematics where course content among ability

groups becomes sharply differentiated beginning in the seventh grade (sometimes in sixth or eighth grades). Since course material is sequential in mathematics, once students embark on a certain sequence of courses, it is very hard to move up to a higher level of difficulty. The mobility in mathematics that does occur is almost always down to a lower level placement (Massachusetts State Department of Education, 1986).

Placement in the accelerated track confers many advantages, both academic and symbolic (Kifer, 1986, 1989; Tucker, 1987; Useem, 1990). Middle grades students who are in accelerated math and are taking a foreign language are far more likely to be labeled by school personnel as highly able students, score substantially higher on their SATs in secondary school, and pursue a significantly more rigorous high school program than their counterparts (Massachusetts State Department of Education, 1986). The great majority of students, however, are placed in "regular" math in the seventh and eighth grade and they encounter a curriculum that has been widely criticized as being only a "counterproductive, dulling review" of elementary school mathematics (Usiskin, 1989). The evidence is accumulating that those who are introduced to algebra in the middle grades are much better prepared to move on to academic math courses in high school (Moses et al., 1989; Ruopp and Driscoll, 1989). Students placed in the remedial course tend to fall further and further behind their classmates who are at grade level. Thus parents need to be especially alert to and involved in this placement decision.

In certain respects parents need a wider knowledge base and an expanded repertoire of intervention skills as their children move out of the elementary grades and confront middle and secondary schooling. The choice of courses becomes more complicated and more consequential. Parents are far less likely to understand course content and the implications of course choices than was the case in elementary school. This is especially true of parents who did not complete high school or who never took advanced mathematics courses in high school or who never went on to college (Karp, 1966). Moreover, parents now must deal with a much more impersonal bureaucratic setting as their children leave elementary school. Understanding of and involvement in the course selection process becomes more difficult, requiring greater self-confidence, more adept and assertive negotiation skills, more aggressive information-gathering, and more sophisticated intervention strategies.

This study hypothesizes that highly educated parents, drawing on the considerable "cultural capital" available to them, are significantly more likely than less educated parents to manage the transition to middle grades coursework in mathematics effectively. These parents are predicted to be more skilled at keeping their children out of the lowest level math group and, at the other end of the tracking continuum, having them assigned to accelerated math levels. It is argued, following Lareau (1987, 1989), Baker and Stevenson (1986) and Stevenson and Baker (1987), that this kind of monitoring and shaping of children's "educational careers" heavily

influences their learning opportunities and achievement and thus helps explain the transmission of social class standing from one generation to the next.

Research Methods

Two adjacent suburban school districts in the Boston area were chosen for this study. Although the two districts were similar demographically, the philosophy and policies on track placement for seventh grade differed dramatically between the two districts, resulting in much higher calculus enrollments among twelfth graders in one of the two districts. They were chosen for study because of this difference. (See Useem, 1990, for a discussion about variations among school districts in placement policies.) In District A, I interviewed 43 mothers and 2 single-parent fathers (who had custody of their children) of seventh graders during November and December, 1988. Mothers were selected for this study (in both towns) because prior research had demonstrated that they are more directly and consistently involved in their children's education than fathers (Youniss and Smollar, 1985; Epstein, 1986; Lareau, 1989). Fathers and children sat in on some of the interviews and contributed their opinions.

The schools supplied class lists with the ability level of each class clearly identified. The parent sample was randomly selected from student class lists and was stratified so that 15 parents from each of the three ability groups was selected. Eighty-seven percent of the parents who were contacted participated in the study; response rates did not vary by children's ability group, mainly because I was able to contact parents directly. These structured interviews, averaging about 45 minutes, took place in the homes or workplaces of 40 of the 45 respondents with the rest being conducted over the telephone.

In District B, parents of sixth graders were interviewed at the end of the sixth grade year (June and July, 1989). In this district, where parents had to give prior approval to participate in the study before I contacted them, 41 mothers (of 43 students) out of the 73 contacted agreed to participate, a response rate of 56 percent. In this case, response rates varied significantly by the mathematics ability group of the student: nearly all (87 percent) of the mothers of children in the accelerated group responded while only 42 percent of the middle group mothers and 44 percent of the mothers whose children were in the lowest group responded. Twenty-six of the interviews were conducted in parents' homes and 15 took place over the telephone.

Two scales were devised in conducting the analysis of the responses of the 86 parents in the sample. Parental social class was based on self-reported educational levels, the dimension of social class that best predicts student achievement (Heyns, 1978). An additive scale combining the educational levels of both parents (Parental Education Index) was

constructed.* A scale measuring parents' involvement in their children's education was also created (Parental Involvement in Education Scale). Parents were ranked as either "high" "medium" or "low" on four different dimensions of involvement: 1) knowledge about the math tracking system and their children's place in it; 2) integration into school volunteer activities at the school, including PTA, and/or into informal parental networks of information about school affairs (e.g. chatting at school events, in the neighborhood, at sports events, at church or temple, at dinner parties, on the telephone); 3) intervention on behalf of one or more of their children with teachers, counsellors, or administrators in order to change or "customize" a particular educational experience; and 4) influence over their children's preferences for math coursework or ability group levels in the middle grades and in high school. The overall Parental Involvement in Education scale was created with scores ranging from 4 to 12, with parents receiving one, two or three points (one for "low" and three for "high") for each of the four dimensions of involvement.

The Ability Group Placement Process

The two schools under study were similar in many respects although the school in District A was a junior high (grades 7 and 8) while the one in District B was a middle school (grades 6-8). Both served students who were largely from middle and upper-middle class white families. Both schools were highly regarded by parents for their experienced and qualified teachers, well-disciplined atmospheres, high student test scores, and sensitivity to students' developmental needs. Administrators in both schools had eliminated ability grouping in nearly all subjects and had organized students into smaller teams or clusters where students shared a group of teachers for core academic subjects. In short, by most traditional criteria, these were "good schools."

Like most other U.S. schools, math tracking began in earnest in the seventh grade in these two schools. Students slated for the "fast track" were placed in a pre-algebra course in the seventh grade leading to algebra in the eighth grade. Admission to this group in District A was restricted to those deemed of "exceptional ability" in mathematics and entrance to it depended heavily on test scores (on a district test and a national standardized test where they needed a score in the top 98th or 99th percentile) as well as the sixth grade teacher's recommendation. As a result, 25 percent of the seventh graders (one-fourth of them admitted because of a parental "override" of the school's placement recommendation) and 20 percent of the eighth graders were in the accelerated course. Admission to the "fast track" was less restrictive in District B. Students' placement depended primarily on teacher recommendation rather than test scores. Approximately 30 percent of the students in the seventh and eighth

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*The following values were assigned: 1-less than high school education; 2-high school graduate; 3-trade school, business school; 4-RN, some college; 5-college graduate; 6-Master's degree; 7-Professional degree (MD,LLD, etc.) or PhD.

grades were in this accelerated track during 1988-89 but the numbers were substantially boosted to over 40 percent in a conscious policy change for 1989-90.

The intermediate group in both schools studied the "regular" math curriculum in which students do not begin pre-algebra until the eighth grade. In District A, the students placed in the bottom groups (about 10 percent of the seventh graders) were in small remedial classes while in District B, the remedial group had been integrated with a "low average" group (36% of the cohort). The placement processes of the two schools also differed because in District A the students came to the junior high from self-contained sixth grade classrooms where ability groups were formed within the classroom. In District B where sixth graders were placed in a middle school, these students were grouped by ability between classrooms. Thus, the fifth grade teacher's recommendation for math placement was important for these students whereas in District A, it was the sixth grade teacher's recommendation (along with test scores) that was more consequential.

Social Class Background, Family Structure, and Ability Group Placement

As expected, there was a high correlation between the parents' educational level and student placement in mathematics ability groups in the sixth and seventh grade. (See Gamoran and Mare, 1987, for a review of social class influences on track placement.) The overall zero-order correlation between ability group placement and the Parent Educational Index was .63 ($p < .001$) (Table 1). Among children in the accelerated group, for example, 89 percent had fathers with an advanced degree compared with only 11 percent of the students in the lowest math group. Indeed, more than half in this accelerated group (56 percent) came from homes where the father had a PhD, MD, LLD, or another professional degree (Table 2).

Mothers' educational levels across groups varied similarly. For example, 69 percent of the mothers of accelerated students had advanced degrees while only 7 percent of the students in the bottom level had mothers with such educational credentials (Table 3). Among the nine families in the sample where both parents had the highest possible education score (PhD or professional degree), all but one had a child in the accelerated curriculum.

It should also be noted that students in the lowest level were significantly more likely than students in the other two levels to be living in a single parent family. More than a third of these students, 37 percent, were living in such a home compared with only 14 percent of the accelerated students and four percent of those in the middle group. Significantly, students in the top group whose parents were divorced were much more likely than students in the other levels to see their fathers on a regular basis and get help from them on their math homework.

Table 1. Zero-Order Correlations Among Variables

	Ability Group Placement	Parent Knowledge	Parent Integration	Parent Intervention	Parent Influence	Parent Involvement Index
Parent Education Index	.63*	.50*	.55*	.36*	.57*	.58*
Ability Group Placement		.59*	.57*	.43*	.53*	.62*

*significant at the .01 level

Table 2. Mathematics Ability Group of Students By Father's Education

Father's Education	Mathematics Ability Group: Accelerated	Regular	Remedial/Low Average
High School or less	5.6% (2)	24.0% (6)	48.1% (13)
Some College/Post-Sec. Trade or Business	2.8% (1)	16.0 (4)	29.6 (8)
College Degree	2.8 (1)	16.0 (4)	11.1 (3)
Master's Degree	33.3 (12)	28.0 (7)	3.7 (1)
PhD/Professional Degree	55.6 (20)	16.0 (4)	7.4 (2)
Total	36	25	27 - 88

Tau-b statistic=0.549, p<0.001

Table 3. Mathematics Ability Group of Students by Mother's Education

Mother's Education	Mathematics Ability Group: Accelerated	Regular	Remedial/Low Average
High School or less	0.0	20.0 (5)	40.7 (11)
Some College/R.N./ Post-Sec. Business	19.5 (7)	24.0 (6)	37.0 (10)
College Degree	11.1 (4)	16.0 (4)	14.8 (4)
Master's Degree	44.4 (16)	32.0 (8)	0.0
PhD/Professional Degree	25.0 (9)	8.0 (2)	7.4 (2)
Total	36	25	27 - 88

Tau-b statistic= 0.476, p<0.0001

Parental Knowledge about the Math Tracking System

Parents were asked a number of questions to determine the degree to which they understood their child's current placement in the ability grouping system in mathematics and the process by which they had learned about the assignment. They were also asked about the placement of their older children. In District A, students had already begun the seventh grade at the time of the interview and parents had just received the first term report card. Decisions about the eighth grade course assignment had not yet been made. In District B, parents were interviewed at the very end of the sixth grade year, after a recommendation had been made for the seventh grade placement. In this case, they were asked how they learned about their child's sixth grade placement (since they were in homogeneous groups for math in the sixth grade in the middle school) as well as the one for seventh grade.

Parents' knowledge of the number of levels, school policies on placement, and the long-term consequences of this decision were also assessed in order to determine whether they had an overall sense of how the ability grouping system worked. They were ranked as either "high," "medium," or "low" in knowledge on the basis of the accuracy of their understanding of their child's own placement as well as their broader grasp of the tracking system's configuration, entrance criteria, curriculum, and educational consequences.

There were differences in the way information was given to parents in the two districts studied that are worth noting. In District A, the parents of sixth graders were informed about the tracking decision for seventh grade in several ways: a letter went home with the recommendation along with a schematic diagram showing the tracking system from 7th-12th grades, parents had conferences with the sixth grade teachers, and teachers explained the system in elementary school open houses during the sixth grade. The letter did not, however, explain that there was a bottom remedial group. In District B, where students were placed in homogeneous math classes as they entered sixth grade in the middle school, parents were told of the placement decision only if they raised the issue in the end-of-year school conference with the fifth grade teacher, and they could ascertain the placement after the first term report card by looking at the fourth digit on a six digit code on the card. They could also learn by attending the open house for the sixth grade in the fall. They were informed of the seventh grade placement decision during the winter when a course selection card was sent home with the math level circled. Parents of students whose group assignment was changed during the spring, as a result of a school policy decision to boost the proportion of children in the top group, received a letter in June explaining the change.

Parents' knowledge of their childen's placement in math groups as well as the extent and accuracy of their understanding of the operation of the tracking system varied by social class. This finding parallels that of

other researchers who have noted that upper middle class mothers know more about their children's educational performance in addition to school practices (Baker and Stevenson, 1986; Lareau, 1987, 1989). The correlation between parents' level of knowledge and the Parental Education Index was .50 ($p < .001$) (Table 1). For example, 65 percent of the mothers with advanced degrees were highly knowledgeable about the tracking system compared with 50 percent of the mothers with a college degree only, 26 percent of those with some college or other post-secondary education, and 25 percent of those with a high school education or less (Table 4).

Seventy percent of the parents of children in the lowest math group in the two districts did not know that their child was in that level or did not understand that this was the bottom math group. By contrast, only six percent of the mothers with children in the accelerated group failed to know accurately their children's course assignment (Table 5). The great majority of less-informed mothers of children in the lowest group (79 percent) were not college graduates; most were high school graduates or had attended a business school after high school. Many of these parents had no recollection of receiving the letter about course placement with the schematic diagram of the tracking system (District A) or of seeing the course selection sheet sent home (District B).

Comments from some of the parents of childen in the lowest level illustrate the issue:

> Boy, that one slipped by me. If I'd known she was in the bottom group, I would have seen the teacher.
>
> I got a course selection sheet but it got lost.
>
> I learned about my son's math placement at the Open House this fall. I was under the impression he was in Regular math. The sixth grade teacher never told me he would be in Remedial math. There was no conference, no letter ... I was shocked.
>
> We didn't know that she was in a remedial group. We were told it was the same math that other children were taking but it was just at a slower pace.
>
> I'm not sure what group my son is in ... but I guess he is in the bottom group because he is getting such simple math. It doesn't seem like seventh grade math. I need to get up there [to the school] and check.
>
> I left the [special education] team meeting last year thinking my son would be placed in Regular math. They had recommended the remedial group and I said "no" ... Everyone there agreed on that [that he would be placed in Regular and monitored] ... I never filled out an override form ... So you see how little

Table 4. Percentage of Mothers Scoring High on Parent Involvement Variables by Mother's Educational Level

Parent Involvement Variables	Mother's Educational Level: Advanced Degree	College Degree	Some College R.N./Business	High School or Less
Knowledge of Tracking	64.9%	50.0%	26.1%	25.0%
Integration into School Affairs/Networks	75.7	50.0	34.8	12.5
Intervention Propensity	54.0	25.0	43.5	12.5
Influence over Course Selection	51.3	33.3	17.4	12.5

Note: Percentages in the four columns are based on, respectively, 37 mothers, 12 mothers, 23 mothers, and 16 mothers.

Table 5. Mother's Knowledge About Child's Mathematics Placement/Tracking System by Mathematics Ability Group Placement of Child

Mother's Knowledge	Mathematics Ability Group of Child: Accelerated	Regular	Remedial/Low Average
High	69.4% (25)	48.0% (12)	11.1% (3)
Medium	25.0 (9)	28.0 (7)	18.5 (5)
Low	5.6 (2)	24.0 (6)	70.4 (19)
Total	36	25	27 - 88

Tau-b statistic=0.522, $p<0.001$

I know. (During the interview the mother found out from her son that he was in the Remedial group.)

Parents who were not college graduates were especially unclear about the long-term implications of the seventh grade math course placement for course choices at the secondary school level. Further, they often had to ask their older children during the interview what math course they were taking in high school. Mothers who had had no academic math courses or whose coursework included only Algebra I or Geometry had only a vague understanding of the differences among math courses and and ability groups at the high school level. This confusion began in the middle grades just as the curriculum content of math classes became more sharply differentiated by level.

Some of the these parents also paid more attention to a child's grade in a course than a child's math track placement, and thus assumed that a student who was getting a B in the bottom group was doing fine even when, in fact, that child might have been performing below grade level. (Lareau, 1989, found the same phenomenon among parents of younger children.) The regularly scheduled teacher conferences they had in elementary school settings, where such matters could be explained by the teacher, were not held at the middle and junior high schools included in this study. As we shall see, parents who were not college graduates were more likely than those who were college graduates to be isolated from formal and informal information networks that might have assisted them in clarifying the math curriculum choices.

Integration into School Affairs and Informal Parental Networks

Those parents who were most knowledgeable about the ability grouping system were also those who were most integrated into a web of school activities and/or informal information networks among parents. The correlation between a measure of parental integration into school affairs and informal networks with a measure of parents' level of knowledge about the math placement process was .69 ($p < .001$) (Table 1). In classifying families as "high," "medium," or "low" in such integration, the activities and connections of both mothers and fathers were considered. Those parents who were categorized as "high" in integration had at least several of the following characteristics: they had been active over a period of years in Parent-Teacher Association (PTA) affairs, had been a volunteer in their children's schools, attended parent-teacher conferences and other school events regularly, or were in frequent communication with other parents about school policies, teacher practices, and course selection. These conversations took place at children's sports events, at PTA meetings, on the telephone, in people's homes, in the neighborhood, at the grocery store, at church or temple, at a recreation center, at book clubs or bridge groups, at "mothers night out" groups, while carpooling, and other locations.

The data show quite conclusively that higher parental educational levels are correlated with greater involvement in school affairs and

integration into informal information networks. The correlation between this dimension of involvement with the Parental Education Index was .55 ($p<.001$) (Table 1). About three-fourths (76 percent) of the mothers with an advanced degree were highly integrated into school affairs and informal information networks compared with 50 percent of the college graduates, 35 percent of those with some college or post-secondary education and only 13 percent of those with a high school diploma or less (Table 4). Other studies as well have demonstrated that parents with high levels of formal education are much more likely to be integrated into activities at the school site (Lareau, 1987, 1989; Stevenson and Baker, 1987; Dauber and Epstein, 1989) as well as tied into off-site sources of information about school affairs (Lareau, 1987, 1989). These findings dovetail with those of other studies which show that upper-middle class college-educated Americans are more likely than others to affiliate with voluntary associations (see Bowen, 1977, for a review; Gans, 1988) and to have a larger network of friends (Bott, 1971; Fischer, 1982).

While parental involvement at the school as a volunteer or PTA activist gave parents valuable insights about their children's educational experiences, some well-educated parents whose demanding work schedules precluded such activity managed to stay abreast of events by relying on information supplied by those who <u>were</u> directly involved at the school. In some cases, it was apparent that integration into these informal networks served as an adequate substitute for involvement in school affairs. Busy professional women often knew just whom to call to find out "what was going on" and what sorts of interventions for their children might be appropriate.

The importance of contact with other parents and at school functions of various kinds in gaining information about the math group placement was commented on by many of the parents who were interviewed:

> I first learned about the math placement at a church supper.
>
> With my older children, I was on the phone all the time getting advice. If the issue was really serious, I'd call people and drop by and have coffee and have a concerned conversating.
>
> I heard at the girls softball game that all the kids at one elementary school took the math placement exam [for entrance into accelerated math] ... but only a few kids took it at our elementary school ... I didn't care for that ... The kids talked about their scores ... That's when I called my friend who is a math teacher at the high school.
>
> A friend of mine was an officer at the high school PTA. She told me it was a big secret about how important it is for your child to be in a certain level in seventh grade math.
>
> I found out at the baseball game last night about the difference

between AB and BC math courses ...[two different levels of advanced mathematics courses in the 11th and 12th grades in this high school]

[Conversations with other parents over the years] have been quite important ... I can give you numerous examples such as learning what teachers to avoid, developing strategies for dealing with the teachers and principal, learning how to work the system and choosing a junior high. I have relied on parents not teachers or administrators at schools, especially friends with older children. I am very plugged into a community of friends and neighbors but not into the school as an institution.

Some of the parents who are isolated from school affairs and information networks talked about the problems associated with that lack of involvement:

I want to meet other parents so badly. I tried to sign up for a course in parenting at the high school but it was full ... I need to talk to others and not feel so isolated ... I don't want to feel I am alone with problems ... I want to hear others who have the same problems.

These math choices are so hidden sort of ... I didn't realize parents could intervene ... My son [who is in the middle math group] needs competition and I'm afraid he's not getting it ... If he doesn't see the competition, he is happy the way he is. If he is exposed to a faster pace, he could rise to the challenge ... But I don't have enough friends to talk about it. (foreign-born mother)

Most mothers reported that they were much more active in school affairs at the elementary school level than at the middle school or high school level, a common finding in other studies of parental involvement (Stevenson and Baker, 1987; Epstein and Dauber, 1988; Dauber and Epstein, 1989). Many made comments that they "had lived at the school" during their children's elementary years. Yet participation dropped off sharply when children entered middle school, in part because so many mothers increased their hours of paid employment or returned to school. Moreover, regular teacher conference times were not scheduled at the middle and high schools in the two districts studied so that parents were far less likely to talk to their children's teachers than was the case in elementary school.

Mothers' contact with other parents decreased as well, not just because they now worked longer hours but also because they were either "burned out" from volunteer work and evening meetings or because older children were allowed more freedom from adult supervision. These mothers had made an effort to know the parents of their small children's friends, but as

children got older, mothers were less likely to know the parents of their new friends in the middle grades. For example, mothers said they were less likely to go out of their way to introduce themselves as they dropped off an older child at a friend's house whereas when their children were smaller, they always walked their children inside and chatted with the mother.

Thus, just as parents confront a sometimes bewildering set of educational choices as their children grow older, their commitment to school volunteer work and their ties with other parents are weakening. This decreasing access to important information sources can severely limit their ability to manage their children's school careers effectively. The phenomenon of decreasing involvement in school affairs was especially pronounced among mothers who did not have a college education. Some of those who were very active at the elementary level, where they felt comfortable in the building, were totally uninvolved at the middle school and junior high levels. The larger and more impersonal middle and junior high schools and high schools were more intimidating to all parents but especially to working class parents who themselves may have had negative secondary school experiences. This isolation from school-based activities may help explain why lesser educated mothers were less likely to know about the math tracking system.

It is important to note that parents who were not college graduates often wanted to be more connected to other parents and to school activities but were prevented from doing so because of their inflexible work hours, language barriers, or their own poor health. These problems, also identified by Smreker (1989), were much more common among those who did not have a college education.

Parental Intervention in Children's Education

Better educated parents were not only more likely to have greater knowledge about and involvement in the educational setting, they were also much more likely than other parents to intervene in direct ways to improve their children's experiences in schools. Parents' propensity to intervene was measured not only by their current attempts to affect school experiences, but their history of attempts over the years with all of their children. Parents were classified as "high," "medium," or "low" on this variable. Typical kinds of interventions included the following: requesting a certain teacher or avoidance of a particular teacher; requesting a placement in a certain "team," "cluster," or "house" at the middle school or secondary level; calling meetings with teachers, principals, counsellors or higher school administrators to ask for a change in teacher behavior or to gain access to certain resources (such as special education services or placement in a special pull-out program); seeking an override or waiver of a teacher's recommendation for course placement; or removing a child from a classroom or school.

Lareau (1989) refers to such interventions as an effort by parents to

"customize" their children's education. She, along with Karp (1966), points out that college-educated parents are far more likely to see themselves as partners with the school in shaping the schooling process compared to working class parents who believe that academic decision-making was primarily the responsibility of school personnel. In this study, the correlation between a measure of parent's propensity to intervene on behalf of their children and the Parental Education Index was .36 ($p < .001$)(Table 1). The differences among social class groups were substantial. For example, just over half of the mothers (54 percent) with advanced degrees were ranked "high" on this intervention scale compared with 25 percent with a college degree and 31 percent of those without a college degree (Table 4). Children in the lowest math group in both schools studied rarely had parents with a history of intervening in schools on their behalf.

Mothers with successful intervention strategies in middle school mathematics placement tended to have advanced degrees. Consider the experiences of several of these mothers who were able to override the placement recommendation of the teacher or curriculum coordinator:

> The sixth grade teacher didn't see our son as highly motivated and he didn't do quite well enough on the standardized test [to be recommended for Accelerated math]. But we saw that the lack of peer group support and poor teaching accounted for his low motivation and we thought he should <u>try</u> [the Accelerated class for seventh grade] ... He is competitive ... We asked the principal her opinion and she said, 'If he wants to be challenged, then override.'"
>
> The sixth grade teacher really didn't know who our son was and said he was borderline [between Accelerated and Regular math]. But his standardized test scores were very high. The teacher tried to talk me out of placing him in Accelerated but I was insistent ... It is pretty hard to move up if you don't start high. You can always move down ... I've been advised by mothers of older children that you have to watch where they're placed.
>
> Towards the end of fifth grade we realized our son was not in the top math group but we felt he could handle it. We talked to the teacher and he put our son in the top group and he did well. Because he was put in so late, the teacher told us he wasn't sure the Middle School would get the information [to place him in the top group there] and told us to follow up with a letter to the Middle School. I did that ... Something funny happened with our other son in the sixth grade. We assumed he was in the top group because he was in the top group in fifth grade. No one told us and we found out [that he was not in the top group] by things he said. When we talked to the teacher about it early in the year, they switched him to the top group. They listened to us and responded ... If you are aware of what's going on.

> [Our daughter's sixth grade teacher] said overrides never made it in his experience. But that is not true. I talked on the phone with the town's curriculum coordinator to see what extra materials she needed to catch up and my husband went to see the math teacher ... The system is too therapeutic, too pampering ... Parents are afraid of being accused of being pushy but I came to this town for a pushy system.
>
> Our daughter tested as average on the national standardized test in math but school administrators wanted to put her in the Remedial class. The teacher and special education specialist had insight into her true abilities [and recommended placement in Regular math]. Our daughter wanted Regular and felt the Remedial class would be a stigma.

Parents with less formal schooling, especially those who have not gone to college, were far more trusting of the teachers and counsellors to assign their children to appropriate ability levels in math and other courses, a finding identical to that of Karp (1966). The comments of some of these parents, all of whose children were in the bottom math group, illustrate this perspective on placement:

> School personnel did it all [in deciding math placement]. I left it up to them and what they thought was best ... I have no idea [what math courses he will take in junior high and high school]. I basically leave it up to the teachers. They know him and know what he needs and doesn't need. So far I've had no problems.
>
> [My daughter's math placement] was most influenced by the school's teachers and counsellors. Whatever they agreed on ... They must know. They have her more than I do.
>
> I choose [courses] very little. I rely heavily on the school's recommedation. My job as a parent is to pick the best public school I can find and move to that neighborhood. That was my strategy ... to take advantage of what they offer.
>
> They're the professionals and I don't take over in that area. I've never felt misplacing has taken place. She is comfortable and is where she belongs.

One foreign-born mother who was a scientist did not realize it was culturally acceptable to ask a teacher for a change in her child's math level: "In my country, teachers decide everything. Here, I feel it is disgraceful to talk to the teacher to ask to put my child in an advanced class."

Parental Influence Over Children's Math Course Choices

Parents were also asked how much influence they had over their children on the issue of assignment to a seventh grade math course and how much influence they were likely to have on the number and type of mathematics courses their children would take (or are already taking) in high school. The issue of parental influence is crucial in public school systems since their wide array of curricular choices allows students to elect easy non-demanding courses. In effect, students can "negotiate their own accomplishment, or, in many cases, their own educational demise" (Sedlak et al., 1986, p. 159). Parental push to select more difficult mathematics courses is especially important since students are often scared off by course descriptions and reputations. It takes a self-confident parent to encourage a reluctant child to enroll in a difficult mathematics course. Further, because high schools often require only two years of mathematics for graduation, it is easy for students to stop taking math altogether unless their parents (or others) urge them to continue.

Because parents with a college degree are more likely to have taken advanced math courses themselves and because they understand the importance of mathematics in educational and career opportunities, they are much more likely than lesser educated parents to push their children in the direction of more rigorous math courses. The correlation between the Parental Education Index and a measure of parental influence over math course choice (where parents were categorized as "high," "medium," or "low") was .57 ($p<.001$)(Table 1). About half (51 percent) of the mothers with advanced degrees were classified as "high" in influence compared with 33 percent of those with a four year college degree, and only 15 percent of those without a college degree (Table 4). None of the mothers with a PhD or professional degree scored "low" on this variable.

The following comments were typical of those college-educated parents (most with graduate degrees) who believed parents should play a major role in the math course choice:

> My son ... who was one of the top math students in his class ... at first had some concern [about being placed in Accelerated math] because the school said it was very selective ... and that scared my son so he considered it for a week. I called the sixth grade teacher ... and said to her 'Can you help me with this?' ... Academically there was no question ... If he had refused Accelerated, I would have said he <u>should</u> do it and would have made a deal with him to try it one month ... I felt it was a psychological issue.

> My son [who was recommended for seventh grade Accelerated] felt Accelerated would be too much work and way too hard. I had to convince him and tell him a C was okay in advanced math. I felt I could always pull him out ... When he first started [in Accelerated], he cried six times over math homework and wanted to drop out. I

said he could but felt he had to give it more time ... But he got an A- in the class and now realizes he is getting it.

As long as my son makes the right decisions, he can choose his courses ... Fifteen year olds don't make those kind of decisions. They should have input but not be the final arbiter.

My daughter was in the top group this year but at midyear she got a B and was recommended for the middle group for seventh grade. I knew that some of the problem was her attitude. I was determined she wasn't going to say 'I'm not good at math and only in English'--she is better in English but she is also capable at math. So we put limits on her and her grade went to an A and she has been recommended to stay in the top group.

Her father feels strongly about her math background. He spends a lot of time with her [on math homework] ... He is a scientist and has strong opinions and he knows what he is talking about.

These attitudes contrasted with the less authoritative approach of parents without a college degree who felt that children themselves should play a major role in course choice. All but one of the following parents had children in the bottom math group:

We're so new at this, having choices. So far we've trusted our son to choose what he wants.

It is up to my son ... It depends on how he likes math ... He could drop math as long as he understood the consequences.

Because of his learning disability, the group [of teachers and counsellors] at the school are really up on knowing about his disability and I trust them ... Realistically, he'll have a lot to say about what he'll do. I went to that high school and it is easy to switch courses.

I don't know anything about math. I am leaving it up to the teachers and counsellors ... and it is up to my daughter. She can decide.

My son should have it [math] all four years of high school because he needs it [but] he's pretty good at making up his own mind ... Now he knows he needs it but I couldn't make him take it.

Children were more likely to be placed in a higher math level if their parents believed it is better to be challenged--even if that meant getting a C and experiencing some frustration--than being bored in a course that was too easy. College-educated parents were more likely to take this view

although there were still a considerable number in their ranks who were worried about the stress children might experience in a demanding course. These parents took the view that a child's happiness (which presumably in their minds was associated with taking a less rigorous class) was more important than being placed in a tougher course. In some instances, children's placement in a non-accelerated math course appeared to be the result of their parents' "low stress" philosophy rather than their actual achievement level in math.

Summary: Parental Involvement in Education, Social Class, and Math Placement

In summary, the finding that parental levels of education was strongly correlated with their children's placement in math levels can be explained in part by the degree of parental involvement in their children's education. The overall correlation between the Parental Education Index and the Parental Involvement in Education scale (a scale that measured all four types of parental involvement) was .57 ($p < .001$) (Table 1). It is evident here that parents with baccalaureate and graduate degrees pass on educational advantages to their children in many direct and indirect ways. They do this by having a much greater awareness of the implications of academic choices made in schools, by being more integrated into school affairs and parent information networks, by having a much greater propensity to intervene in educational decisions being made for their children in school, and by their greater likelihood of exerting influence with their children over course choice. Indeed, once the overall Index of Parental Involvement is taken into account, the correlation between parental education level and math course placement dropped from .63 to .41 ($p<.001$), a substantial reduction. While parental social class has a direct effect on course placement, then, it also operates indirectly by boosting parents' propensity to be involved in their children's schooling experience which in turn affects placement decisions. In other words, the impact of social class on course assignment is partially mediated by parental involvement.

CONCLUSION

The results of this study confirmed the hypothesis that highly educated parents were much more likely than less-educated parents to have the resources or "cultural capital" needed to successfully manage their children's academic transition to middle or junior high school. Parents with baccalaureate and graduate degrees succeeded much more often than non-college graduates in having their children placed in academically challenging mathematics ability groups, putting them on a track of sequential courses that would lead to better preparation through the high school (and college) years. Placement in these groups was not necessarily based on some objective, highly accurate assessment of student "ability" by school professionals. Instead, placement often depended on parents' willingness to take steps to insure that their children had the opportunity to learn more advanced material even when school personnel recommended

against it or their children resisted it. In a number of cases studied here, it was parents' lack of involvement, social isolation, reluctance to intervene and influence their children's program in a more demanding direction--all factors highly associated with social class--rather than the child's academic ability that accounted for a child's placement in a lower math level.

As we have seen from the interview data, highly educated parents had a number of advantages as they guided their children through the complex curricular maze of U.S. public middle and secondary grades. Just as Lareau (1987, 1989) found with parents of younger students, these parents were much more integrated into school affairs and activities as well as informal parental information networks so that their fund of knowledge about how the tracking system worked was much more extensive than that of other parents. Moreover, once armed with this knowledge, they were much more inclined than less-educated parents to intervene in direct and indirect ways to keep their children out of remedial (or bottom level) courses or to insure their placement in an accelerated class. They also had a greater propensity to talk their children into trying a more advanced level of mathemetics. It is this utilization of a complex set of interpersonal and social skills acquired by the college-educated that helps explain how they boost their children's ability group or course assignment. Ultimately, as recent research has shown, this placement plays a crucial role in determining their children's level of academic achievement (Oakes, 1985; Gamoran, 1987; Vanfossen, Jones, and Spade, 1987).

This intervention into the placement process, both with school officials and with the children themselves, is one of the mechanisms by which social class advantage is transmitted from one generation to the next. In this instance, the intervention and influence occurred around the question of placement into a sequence of mathematics courses which begins in the seventh grade and continues through high school. This is only one in a whole series of critical decision points that occur throughout a child's educational career in the U.S. It is the accumulation of parents' influence across an array of these decision points that helps determine their children's success in the system. As Baker and Stevenson (1986) and Lareau (1987, 1989) point out, the passing on of educational advantages from parents to children does not occur automatically but instead depends on the active involvement of parents in the educational process over many years.

The actions of well-educated parents in boosting their children's placement in the tracking system help illustrate the view that ability is to some extent "socially constructed" (Cicourel and Kitsuse, 1963; Rosenbaum, 1986). Since ability grouping and coursetaking influence students' opportunity to learn certain material and hence affect their achievement, then it follows that parents' success in boosting children's placement influences academic achievement. Children become labeled as "bright" based in part on high test scores or grades but also because of the fact of having been placed in a higher level course or group. In the case of mathematics,

those placed in an accelerated group in the seventh grade have the opportunity to take calculus in the 12th grade, a subject which "signals" to counsellors and college admissions officers that the student is on the "fast track" (Useem, 1990). As one mathematics educator put it, "A calculus course on the transcript is the sign of an educated person" (Tucker, 1987, p.15). Such "signaling," as Rosenbaum (1986) suggests, is crucial as students try to move ahead in tournament-like fashion in competitive educational environments.

Yet researchers of tracking have treated the variable of "ability" as though it were independent of social class, and have concluded that track placement depends more on ability than it does on parental socioeconomic status (Heyns, 1974; Rehberg and Rosenthal, 1978; Alexander and Cook, 1982). But as Vanfossen, Jones, and Spade (1987) have noted, ability is a variable that is strongly influenced by parents' social class and should therefore be seen as a contaminated measure. This study, which examined parental interventions at the time placement decisions were actually happening, supports this critique by showing how closely course assignment decisions are bound up with parental social class. Researchers should therefore be more suspicious of studies which conclude that once ability is held constant, the relationship between social class and tracking/coursetaking becomes less significant.

From a social policy standpoint, educators should once again question the practice in U.S. public schools of offering so many choices of ability groups and courses in the middle and secondary grades. The research evidence is fairly clear that this practice has the effect of magnifying social class differences in achievement (Rosenbaum, 1976, 1980; Cusick, 1983; Powell, Farrar, and Cohen, 1983; Sedlak et al., 1986). Public schools, unlike private and parochial schools, are officially neutral about what courses and levels children should be placed in, leaving parents somewhat in the dark about what might be truly best for their children (Powell, Farrar, and Cohen, 1983). Moreover, the configuration and consequences of tracking are only partially or never explained to students and parents (Rosenbaum, 1976, 1986; Oakes, 1985) so that only the most savvy, well integrated parents figure it out. Indeed, in this study, it was the parents with graduate degrees who were most adept at discerning the meaning of course placement. Even when schools are relatively open about describing ability group choices, parents who are less educated often remain ill-informed about the placement process. Public schools would do well to reduce the complexity and differentiation of the curriculum and to provide more authoritative guidance on the meaning of choices, as is the case in private and parochial schools, if they are serious about reducing social inequities in academic achievement.

REFERENCES

Alexander, K.L., and M.A. Cook. 1982. "Curricula and Coursework: A Surprise Ending to a Familiar Story." American Sociological Review 47:626-40.

Baker, D.P., and D.L. Stevenson. 1986. "Mothers' Strategies for Children's School Achievement: Managing the Transition to High School." Sociology of Education 59:156-166.

Becker, H.J., and J.L. Epstein. 1982. "Parent Involvement: A Study of Teacher Practices." Elementary School Journal 83:85-102.

Bordieu, P. 1977. "Cultural Reproduction and Social Reproduction." Pp. 487-511 in Power and Ideology in Education, edited by J. Karabel and A.H. Halsey. New York: Oxford University Press.

Bourdieu, P. and J. Passeron. 1977. Reproduction in Education, Society and Culture. Translated by Richard Nice. Beverly Hills: Sage.

Bott, E. 1971. Family and Social Networks. New York: Free Press.

Bowen, H.R. 1977. Investment in Learning. San Francisco: Jossey-Bass.

Cicourel, A. and J. Kitsuse. 1963. The Educational Decision-Makers. Indianapolis: Bobbs Merrill.

Clark, R. 1983. Family Life and School Achievement. Chicago: University of Chicago Press.

Coleman, J.S., T. Hoffer, and S. Kilgore. 1982. High School Achievement: Public, Catholic, and Private Schools Compared. New York: Basic Books.

Cusick, P.A. 1983. The Egalitarian Ideal and the American High School. New York: Longman.

Dauber, S.L. and J.L. Epstein. 1989. "Parents' Attitudes and Practices of Involvement in Inner-City Elementary and Middle Schools." Paper presented at the annual meetings of the American Educational Research Association, San Francisco.

Dornbusch, S.M., P.L. Ritter, P. Liederman, D. Roberts, and M. Fraleigh. 1987. "The Relation of Parenting Style to Adolescent School Performance." Child Development 58: 1244-1257.

Ekstrom, R., M. Goertz, and D.A. Rock. 1988. Education and American Youth. Philadelphia: The Falmer Press.

Epstein, J.L. 1985. "Home and School Connections in Schools of the

Future: Implications of Research on Parent Involvement." Peabody Journal of Education 62: 18-41.

_____. 1986. "Parents' Reactions to Teacher Practices of Parent Involvement." The Elementary School Journal 86:277-294.

_____. 1987. "Parent Involvement: What Research Says to Administrators." Education and Urban Society 19:119-136.

_____. 1988. "Parent Involvement." Pp. 187-189 in Encyclopedia of School Administration and Supervision, edited by R. Gorton, G. Schneider and J. Fisher. Phoenix: Oryx Press.

Epstein, J.L., and S.L. Dauber. 1988. "Teacher Attitudes and Practices of Parent Involvement in Inner-City Elementary and Middle Schools." Paper presented at the annual meetings of the American Sociological Assocation, Atlanta.

Fischer, C.S. 1982. To Dwell Among Friends: Personal Networks in Town and City. Chicago: University of Chicago Press.

Gamoran, A. 1987. "The Stratification of High School Learning Opportunities." Sociology of Education 60:135-155.

Gamoran, A., and R.D. Mare. 1989. "Secondary School Tracking and Educational Inequality: Compensation, Reinforcement, or Neutrality?" American Journal of Sociology 94:1146-83.

Gans, H.J. 1988. Middle American Individualism. New York: The Free Press.

Heyns, B. 1974. "Social Selection and Stratification within Schools." American Journal of Sociology 79:1434-51.

_____. 1978. Summer Learning and the Effects of Schooling. New York: Academic Press.

Hoffer, T., A.M. Greeley, and J.S. Coleman. "Achievement Growth in Public and Catholic School." Sociology of Education 58(2):74-97.

Karp, D.A. 1966. "Parental Aspiration and Educational Mobility: Some Influences on Parental Support for College Planning by High Ability Eighth Grade Boys and Girls." Undergraduate Thesis, Harvard University, Cambridge.

Kifer, E. 1986. "What Opportunities are Available and Who Participates When Curriculum is Differentiated? Paper presented at the annual meetings of the American Educational Research Association, San Francisco.

_____. 1989. "Opportunities, Talents, and Participation." In Student Growth and Classroom Process in the Lower Secondary Schools, Second International Mathematics Study, edited by Leigh Burstein.

Lareau, A. 1987. "Social Class Differences in Family-School Relationships: The Importance of Cultural Capital." Sociology of Education 60:73-85.

_____. 1989. Home Advantage. Philadelphia: The Falmer Press.

Lee, V.E. and A.S. Bryk. 1988. "Curriculum Tracking as Mediating the Social Distribution of High School Achievement." Sociology of Education 61:78-94.

_____. 1989. "A Multilevel Model of the Social Distribution of High School Achievement." Sociology of Education 62:172-192.

Lee, V.E., and Ekstrom, R.B. 1987. "Student Access to Guidance Counseling in High School." American Educational Research Journal 24(2):287-310.

Lightfoot, S. L. 1978. Worlds Apart. New York: Basic Books.

Litwak, E., and H.J. Meyer. 1974. School, Family, and Neighborhood: The Theory and Practice of School-Community Relations. New York: Columbia University Press.

Marjoribanks, K. 1979. Families and Their Learning Environments. London, England: Routledge and Kegan Paul.

Massachusetts State Department of Education. 1986. "The High School Experience in Massachusetts." Quincy, Massachusetts.

Miller, J.D., and P. Casserly. 1988. "Family and Peer Encouragement of the Study of Mathematics." Paper presented at the annual meetings of the American Educational Research Association, New Orleans.

Moles, O. 1982. "Synthesis of Recent Research on Parent Participation in Children's Education." Educational Leadership 40:44-47.

_____. 1987. "Who Wants Parent Involvement? Interest, Skills and Opportunities among Parents and Educators." Education and Urban Society 19:137-145.

Moses, R.P., M. Kamii, S.M. Swap, J. Howard. 1989. "The Algebra Project: Organizing in the Spirit of Ella." Harvard Educational Review 59:423-443.

Oakes, J. 1985. Keeping Track: How Schools Structure Inequality. New Haven: Yale University Press.

Powell, A., E. Farrar, and D. Cohen. 1985. The Shopping Mall High School. Boston: Houghton Mifflin.

Rehberg, R.A., and T.R. Rosenthal. 1978. Class and Merit in the American High School. New York: Longman.

Rosenbaum, J.E. 1976. Making Inequality: The Hidden Curriculum of High School Tracking. New York: Wiley.

_____. 1980. "Track Misperceptions and Frustrated College Plans: An Analysis of the Effects of Tracks and Track Perceptions in the National Longitudinal Survey." Sociology of Education 53:74-78.

_____. 1986. "Institutional Career Structures and the Social Construction of Ability." Pp. 139-171 in Handbook of Theory and Research in the Sociology of Education, edited by J.G. Richardson. New York: Greenwood Press.

Rubinson, R. 1986. "Class Formation, Politics, and Institutions: Schooling in the United States." American Journal of Sociology 92:519-548.

Ruopp, F., and M. Driscoll. 1990. "Access to Algebra." The Harvard Education Letter, 6:4-5.

Scott-Jones, D. 1984. "Family Influences on Cognitive Development and School Achievement." Pp. 259-304 in Review of Research in Education, edited by E. Gordon. Washington, D.C. American Educational Research Association Press.

Schafer, W.E., and C. Olexa. 1971. Tracking and Opportunity. Scranton, PA: Chandler.

Sedlak, M.W., C.W. Wheeler, D.C. Pullin, P.A. Cusick. Selling Students Short. New York: Teachers College Press.

Stevenson, D.L., and D.P. Baker. 1987. "The Family-School Relation and the Child's School Performance." Child Development 58: 1348-1357.

Swap, S.M. 1987. Enhancing Parent Involvement in Schools. New York: Teachers College Press.

Tucker, T.W. 1987. "Calculus Tomorrow." Pp. 14-17 in Calculus for a New Century: A Pump Not a Filter, edited by L.A. Steen. Washington, D.C.: Mathematical Association of America.

Useem, E. 1990. "Getting on the Fast Track in Mathematics: School Organizational Influences on Math Track Assignment." Paper presented at the annual meetings of the American Educational Research Association, Boston.

Usiskin, Z. 1989. "The University of Chicago School Mathematics Project." Autumn issue. University of Chicago.

Vanfossen, B.E., J.D. Jones, and J.Z. Spade. 1987. "Curriculum Tracking and Status Maintenance." Sociology of Education 60:104-122.